CCS Technical Documentation
RH-48 Series Transceivers

Troubleshooting – Antenna

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Troubleshooting - Antenna

This troubleshooting guide addresses potential failures that will affect antenna performance of the RH-48 phone, and discusses methods for correction of these failures.

Relevant Documents

C-Max Antenna RF Specifications and Plan (DHS02726-EN-1.0)

Failures and Corrective Measures

Appearance of phone

Figure 1: Front view of RH-48 (Model 3105)

Figure 2: Back view of RH-48 (Model 3105)

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Internal Antenna Missing

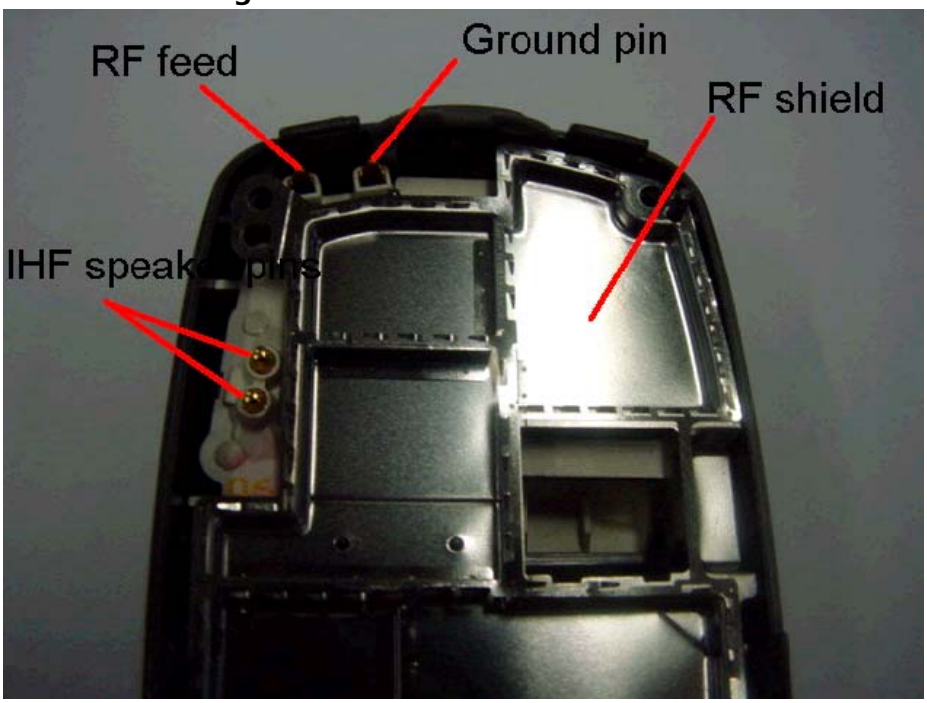

Figure 3: RH-48 chassis assembly

If the internal antenna is missing, install one. If the radiator looks obviously damaged, then replace the internal antenna.

If no internal antenna is installed, the antenna gain will be degraded by more than 25dB.

Damaged RF Feed Pin or Ground Pin

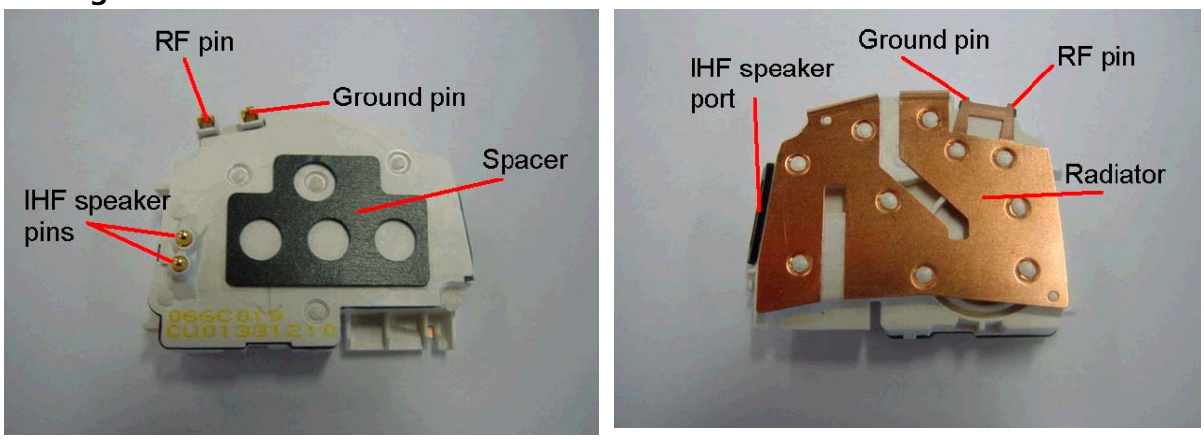

Figure 4: Top and bottom views of the RH-48 internal antenna

If either the RF feed pin or ground pin are broken or bent such that either pin will not touch the PWB, then the internal antenna must be replaced. If the springs for the RF or ground pin appear damaged, then the internal antenna must be replaced. If the slot in the radiator has a significantly different shape, then the correct internal antenna must be installed. If there is any other obvious damage to the radiator (dents, corrosion), then the antenna should be replaced. If the pin gets stuck or has excessive friction in the plastic tube/guiding feature, then the spring will not work properly and the antenna should be replaced.

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If the RF feed doesn't touch the PWB, then the antenna gain will degrade by more than 25dB. If the ground pin doesn't touch the PWB, then the antenna gain may degrade about 5 to 10dB.

If either of the IHF speaker pins is damaged or if the IHF speaker is nonfunctioning, then the antenna module should be replaced.

Wrong Internal Antenna Installed

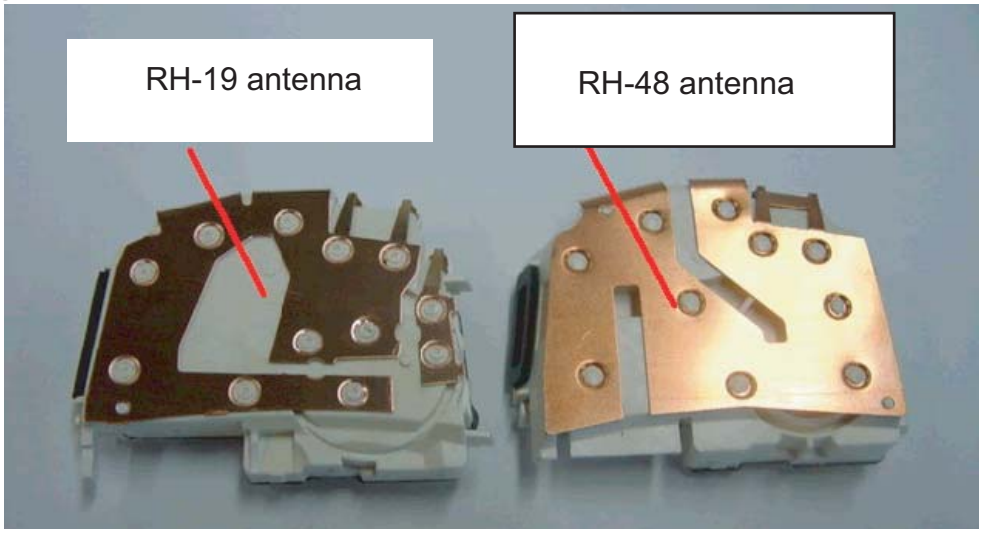

Figure 5: Top views of the RH-19 and RH-48 antennas

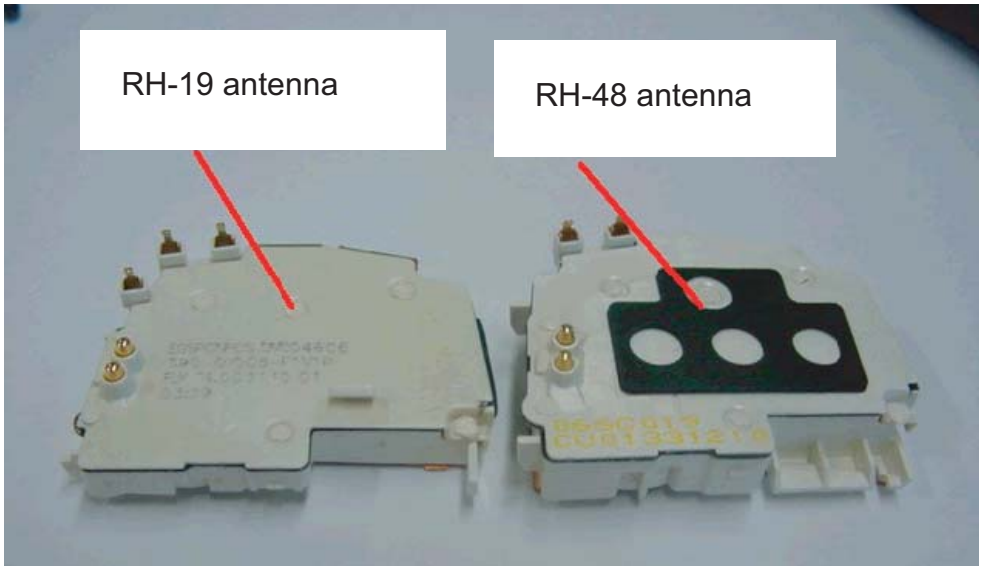

Figure 6: Bottom views of RH-19 and RH-48 antennas

The RH-48 and RH-19 antennas are similar in appearance. The important visual difference in the antennas is that the slot pattern is very different. Also, the RH-48 antenna is thicker than the RH-19 antenna and also has a spacer on its back side.

If the wrong antenna is installed, install the correct one.

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Obstructed RF Feed or Ground Pads for Internal Antenna, or IHF Speaker Pads

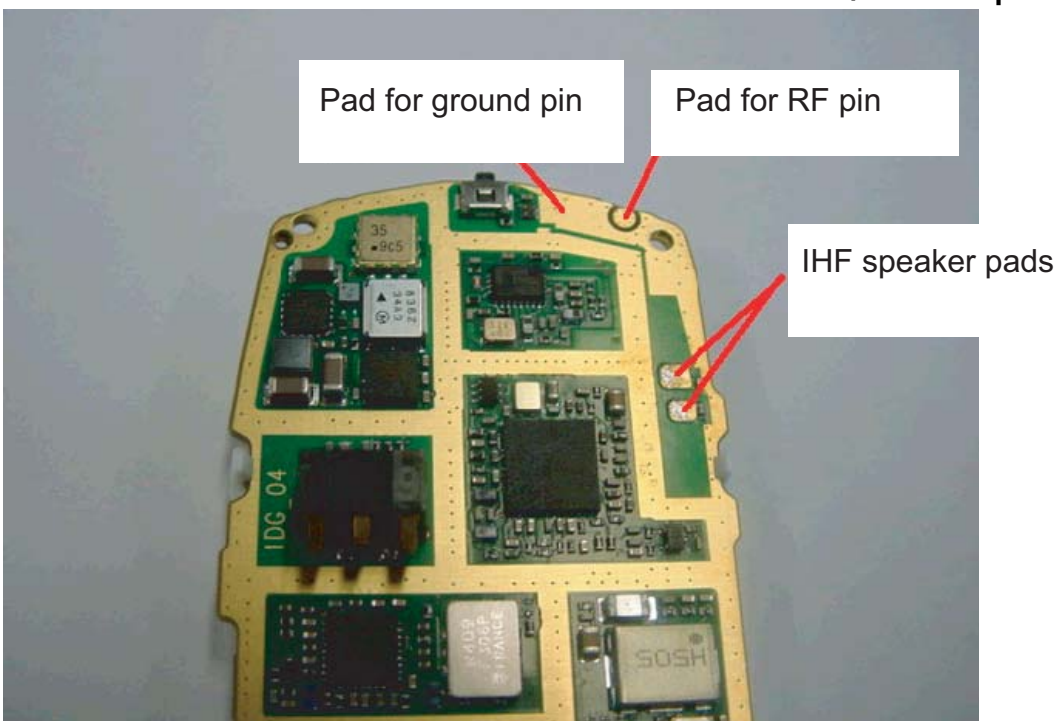

Figure 7: PWB layout of RF feed and ground pads and IHF speaker pads

If the RF feed pad is obstructed, removed, or covered, then the RF feed pin will not touch the PWB and the antenna gain will degrade by more than 25dB. If the ground pad is obstructed, removed, or covered, then the ground pin will not touch the PWB and the antenna gain may degrade by about 5 to 10dB. If corrosion is present or the pad is missing, most likely the PWB and phone needs to be replaced. If either pad is obstructed or covered, the pad should be cleared and/or cleaned.

If the Internal Hands Free (IHF) speaker pads are obstructed, removed, or covered, the IHF speaker will not produce sound. If corrosion is present or the pad is missing, most likely the PWB and phone needs to be replaced. If either pad is obstructed or covered, the pad should be cleared and/or cleaned.

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Grounding of Display Frame

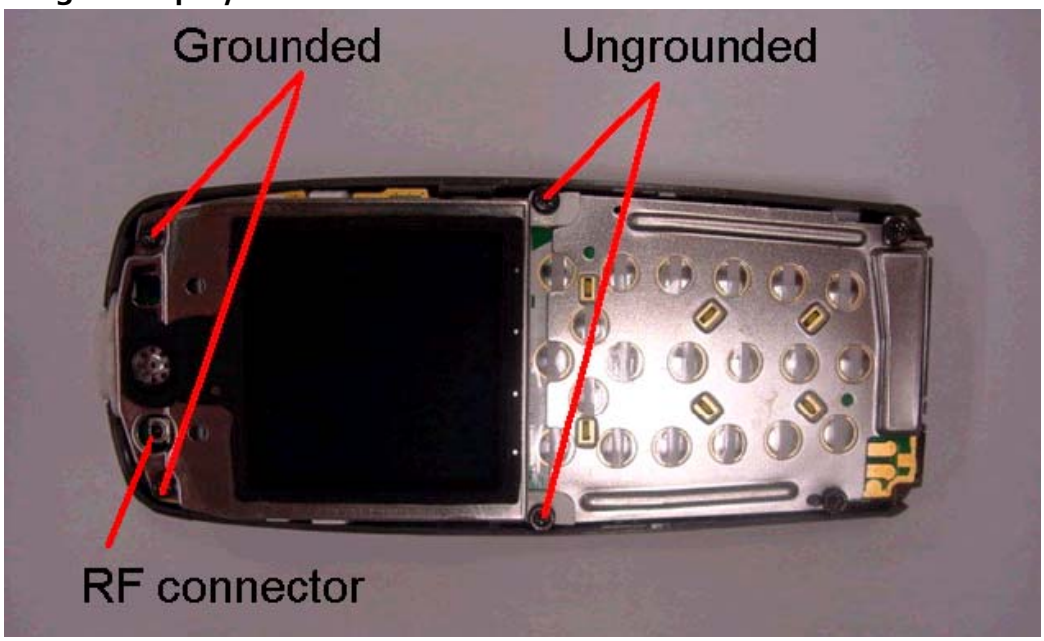

Figure 8: Display assembly

Note that the display frame is grounded to the PWB through the two top screws. The grounding of the display frame will impact the radiation performance of the phone. If the screws are loose, then tighten them. If the screw bosses are stripped, then the chassis will need to be replaced. If the screws are missing, install new ones.

The middle screws should not touch the metal in the LCD frame, the metal shield over the keypad, the PWB, or the RF shield. When driving in these screws, be sure to drive them in straight. If the screws are driven in at an angle, it is much more likely that the screws will touch the PWB or the RF shield. If this happens, then antenna performance could change by about 1dB.

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Grounding of RUIM Card Flap

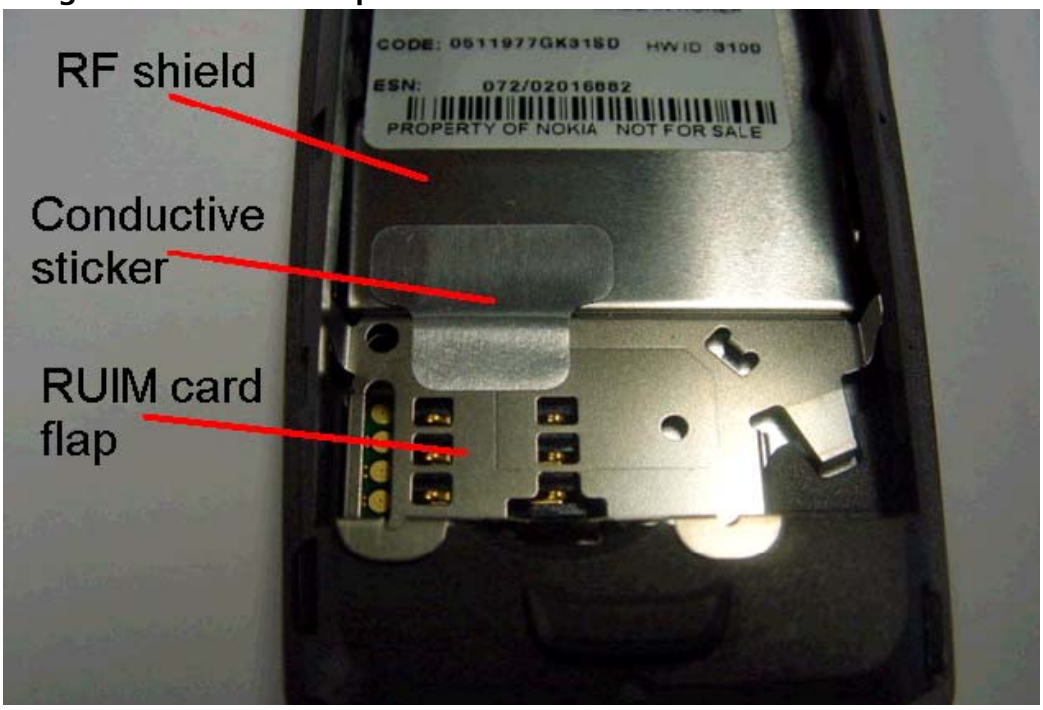

Figure 9: Conductive sticker grounding RUIM card flap to RF shield

The RUIM card flap needs to be grounded to the RF shield with a conductive sticker. The shape and location of the conductive sticker is shown in the figure above. If the conductive sticker is missing or ripped, it needs to be replaced.

If the sticker is damaged or missing, then the radiated sensitivity could be reduced by 4-8dB.

RF Connector Failure

The RF connector could fail by not connecting the RF input to the RF output of the RF connector. If this happens, then the antenna gain will degrade by about 25dB. This can be checked by testing for DC conductivity between the RF input and RF output of the RF connector. Note the DC conductivity test must be done without any cable attached to the RF connector. Since the RF connector is also a switch, the RF output will be disconnected from the RF input when a cable is inserted into the RF connector. When a cable is inserted, the RF input is connected to the RF connector. The location is shown in Figure 6.

RF input — connector to duplexor

RF output — connects to antenna pad through vias

RF connector — connects to coaxial cable

If the RF input is not connected properly to the RF output, the RF connector must be replaced.

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